Faculty and staff of USAFA and Otero Junior College pose with a newly installed clamshell dome located on the La Junta campus. ▲

View of the FalconSAT-5 taken from the Falcon telescope at USAFA. ▶

Photo credit: Dr. Francis Chun, USAFA

U.S. AIR FORCE ACADEMY
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Falcon Telescope Network Helps to Identify Space Objects

The Center for Space Situational Awareness Research (CSSAR) in the Department of Physics at the U.S. Air Force Academy (USAFA) is developing a $2.25 million Falcon Telescope Network (FTN) and Cadet Space Operations Center to develop new techniques and algorithms for satellite characterization and data fusion for the space domain, conduct innovative astronomical research, and support STEM activities. The FTN, co-funded by the USAFA and the Air Force Office of Scientific Research, is a low-cost global network of small aperture telescopes that, when used in conjunction with pre-existing methods of space object identification, will demonstrate significant improvements in space situational awareness (SSA) capabilities.

Currently, the U.S. Space Surveillance Network maintains orbit information over 23,000 space objects, approximately 1,200 of which are active satellites. Of these, the U.S. owns and operates about half. As more powerful SSA sensors come online, it is estimated that the space catalog will increase another order of magnitude. Maintaining SSA requires a migration from catalog maintenance to full characterization and assessment of space objects. The ramifications of potential adversaries "hiding" a satellite weapon as a piece of debris or causing one of their satellites to spawn barnacle satellites with the potential to conduct hostile operations would be catastrophic to the U.S. and its allies. Since the vast majority of space catalog objects are debris, characterizing those objects will enable new technologies for removing them from orbit and making space operations safer for all nations.

The initial FTN will consist of 12 fixed telescope sites and 2 mobile telescope observatories. Five telescopes will be located around Colorado, and at least four will be overseas. All of the FTN partners are educational institutions, and will have access to the entire network to support their own education curriculum, research, and STEM outreach to their local communities.

All of the components of an FTN observatory are commercially available and manufactured in the U.S., Italy or Canada. Each telescope node will be nearly identical in configuration, allowing easier maintenance and enabling robotic operations. The USAFA is providing all telescope equipment to each partner institution, while partners provide an observatory location, utilities, and communications. Some FTN partners are already constructing the observatory building in anticipation of receiving the telescope.

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